

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (Currently amended) A processing apparatus including a processing vessel, a mount table arranged in the processing vessel to allow a process object to be placed thereon, and a shower head structure arranged at a ceiling portion of the processing vessel to supply a process gas into an interior of the processing vessel,

wherein the shower head structure includes:

a shower head main body having a generally cup shape, the shower head main body having a bottom wall provided with a plurality of gas injection holes formed therein and a side wall rising from a peripheral portion of the bottom wall, wherein an upper end of the side wall has steps providing at least one projection;

a head mounting frame arranged at the ceiling portion of the processing vessel to support the shower head main body, the head mounting frame having at least one through-hole into which the projection of the side wall of the shower head main body is inserted, with portions of the side wall other than the projection not being inserted into the through-hole, the through-hole and the projection being configured such that the projection is insertable into the through-hole from a lower side of the head mounting frame, and wherein the head mounting frame is a unitary structure;

a cooling mechanism attached to an upper end portion of the projection of the side wall of the shower head main body inserted into the through-hole of the unitary head mounting frame and exposed to an exterior of the processing vessel;

screw bolts each extending from the lower surface of the bottom wall of the shower head main body through the bottom wall of the shower head main body, and being in thread engagement with the head mounting frame; and

at least one diffusion chamber forming plate housed in the shower head main body and joined to the head mounting frame, and defining a gas diffusion chamber which is supplied with the process gas and is communicated with the gas injection holes.

2. (Original) The processing apparatus according to claim 1, wherein the head mounting frame is fixed to the processing vessel via a hinge while allowing pivotal movement of the head mounting frame with respect to the processing vessel, so that the head mounting frame can be separated from the processing vessel.

3. (Previously presented) The processing apparatus according to claim 1, wherein the head mounting frame has, as said at least one through-hole, a plurality of through-holes, the shower head main body has, as said at least one projection, a plurality of projections, the plurality of projections of the side wall of the shower head main body are respectively inserted into the plurality of through-holes, and the through-holes are arranged at angular intervals in a circumferential direction.

4. (Previously presented) The processing apparatus according to claim 1, wherein the shower head structure includes, as said at least one diffusion chamber forming plate, a plurality of diffusion chamber forming plates, which are stacked in layers in the shower head main body.

5. (Original) The processing apparatus according to claim 1, wherein the cooling mechanism includes a Peltier device and a cooling jacket allowing a coolant to flow therethrough.

6. (Currently amended) A processing apparatus including a processing vessel, a mount table arranged in the processing vessel to allow a process object to be placed thereon, and a shower head structure arranged at a ceiling portion of the processing vessel to supply a process gas into an interior of the processing vessel,

wherein the shower head structure includes:

a shower head main body having a generally cup shape, the shower head main body having a bottom wall provided with a plurality of gas injection holes formed therein and a side wall rising from a peripheral portion of the bottom wall, wherein an upper end of the side wall has steps providing at least one projection;

a head mounting frame arranged at the ceiling portion of the processing vessel to support the shower head main body, the head mounting frame having at least one through-hole into which the projection of the side wall of the shower head main body is inserted, with portions of the side wall other than the projection not being inserted into the through-hole, the through-hole and the projection being configured such that the projection is insertable into the through-hole from a lower side of the head mounting frame, and wherein the head mounting frame is a unitary structure and the shower head main body is attached to the unitary head mounting frame such that the projection of the side wall of the shower head main body is exposed to an exterior of the processing vessel; and

at least one diffusion chamber forming plate housed in the shower head main body and defining a gas diffusion chamber which is supplied with the process gas and is communicated with the gas injection holes.

7. (Previously presented) The processing apparatus according to claim 6, wherein the head mounting frame is fixed to the processing vessel via a hinge while allowing pivotal movement of the head mounting frame with respect to the processing vessel, so that the head mounting frame can be separated from the processing vessel.

8. (Previously presented) The processing apparatus according to claim 6, wherein the head mounting frame has, as said at least one through-hole, a plurality of through-holes, the shower head main body has, as said at least one projection, a plurality of projections, the plurality of projections of the side wall of the shower head main body are respectively inserted into the plurality of through-holes, and the through-holes are arranged at angular intervals in a circumferential direction.

9. (Previously presented) The processing apparatus according to claim 8 wherein the head mounting frame comprises a circumferential, ring shaped flange extending radially between the through-holes and a surface defining a more central, circular head fixing opening in said head mounting frame.

10. (Previously presented) The processing apparatus according to claim 6, wherein the shower head structure includes, as said at least one diffusion chamber forming plate, a plurality of diffusion chamber forming plates, which are stacked in layers in the shower head main body.

11. (Previously presented) The processing apparatus according to claim 6, further comprising a cooling mechanism and wherein the cooling mechanism includes a Peltier device and a cooling jacket allowing a coolant to flow therethrough, and said Peltier device being mounted on an upper end of said projection.

12. (Currently Amended) The processing apparatus according to claim 3 wherein the head mounting frame comprises a circumferential, ring shaped flange extending radially between the through-holes and a surface defining a more central, circular head fixing opening in said head mounting frame.

13. (Previously Presented) The processing apparatus according to claim 1 wherein said head mounting frame is a monolithic structure.

14. (Previously Presented) The processing apparatus according to claim 6 wherein said head mounting frame is a monolithic structure.

15. (New) The processing apparatus according to claim 1, wherein the through-hole has a circular-arc shape in plan view.

16. (New) The processing apparatus according to claim 6, wherein the through-hole has a circular-arc shape in plan view.

17. (New) The processing apparatus according to claim 3, wherein each of the through-holes passes completely through the head mounting frame in a vertical direction.

18. (New) The processing apparatus according to claim 8, wherein each of the through-holes passes completely through the head mounting frame in a vertical direction.

19. (New) The processing apparatus according to claim 1, wherein the portions of the side wall other than the projection not being inserted into the through-hole each have an upper surface extending beneath and along a lower surface portion of the head mounting frame.

20. (New) The processing apparatus according to claim 6, wherein the portions of the side wall other than the projection not being inserted into the through-hole each have an upper surface extending beneath and along a lower surface portion of the head mounting frame.